Arizona Department of Health Services

ARIZONA – VALLEY FEVER REPORT

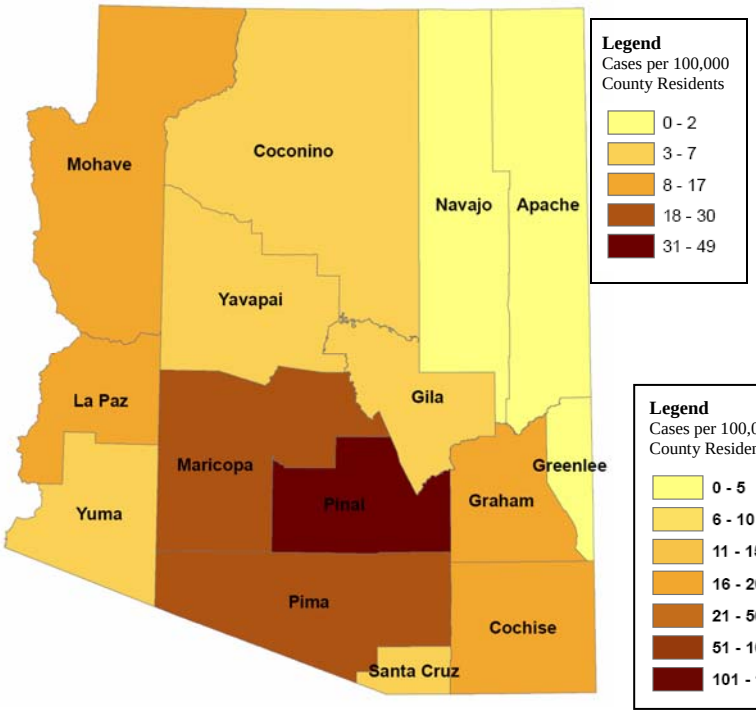
March 2008

Summary:
For the year 2007, a total of 4858 valley fever (coccidioidomycosis) cases were reported from across all fifteen counties in Arizona. For the year-to-date 2008, 1184 valley fever cases have been reported to the state: 446 cases for the month of January, 417 cases for February, and 321 cases for March.

Data in this report are provisional and may change as more reports are received.

Valley Fever Activity by County:

Map 1. Valley Fever Incidence (1/1/2007-6/29/2007)



Map 2. Valley Fever Incidence, 2006

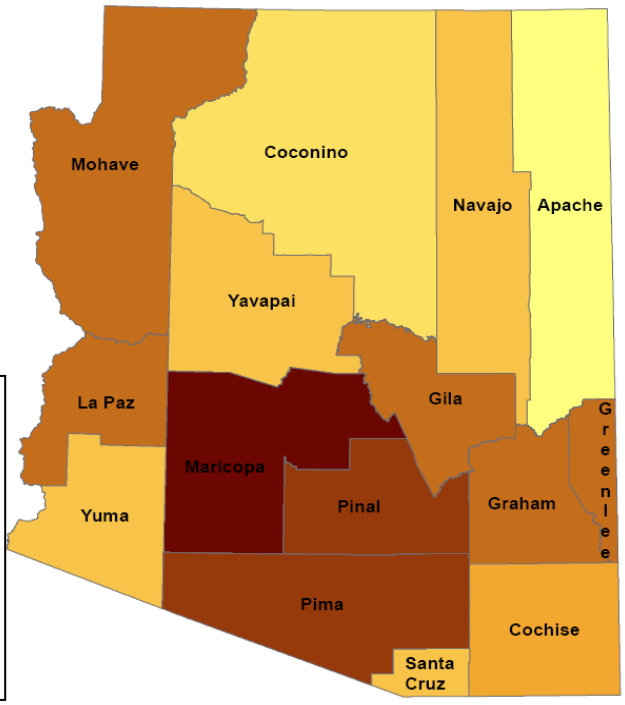


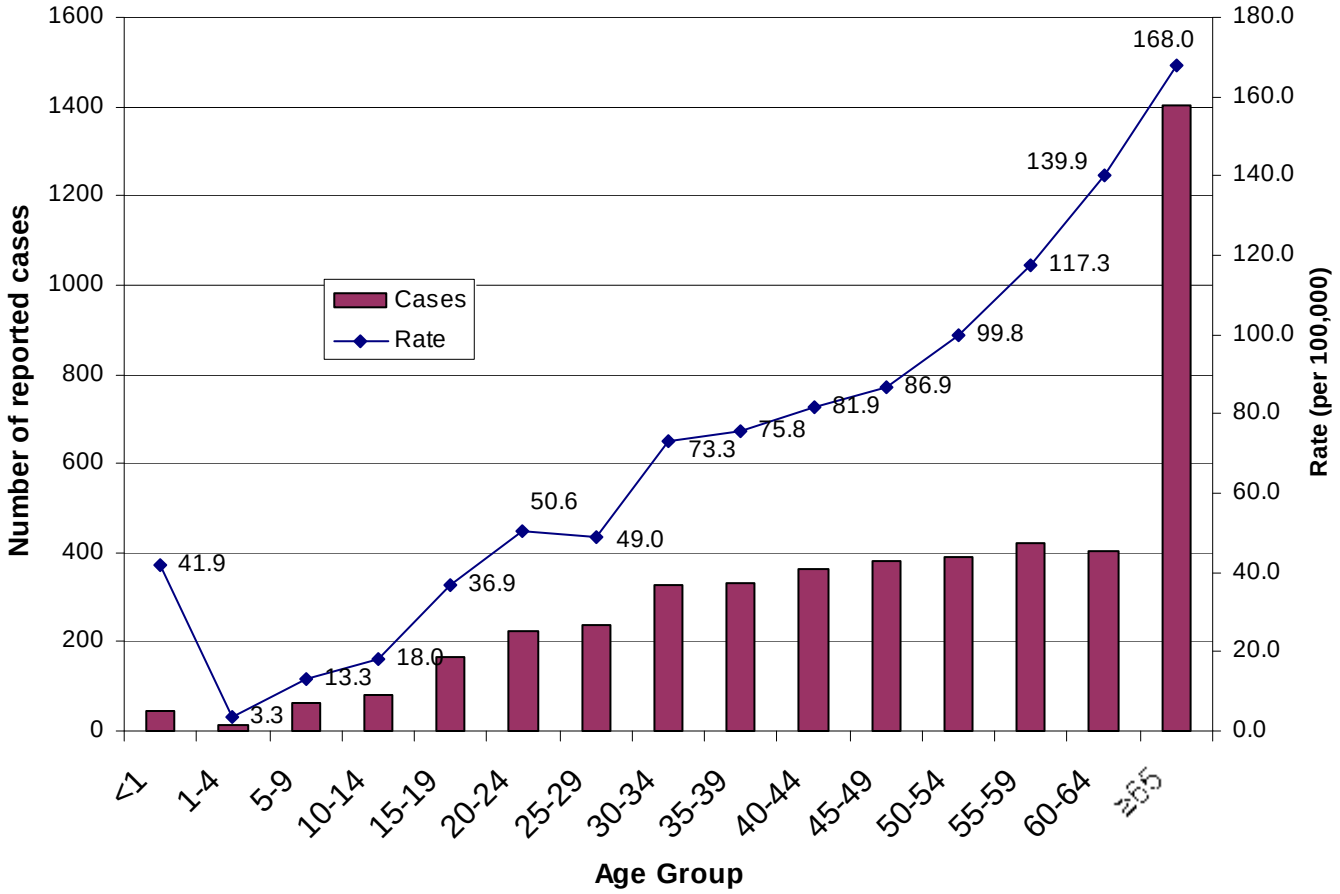
Table 1. Valley Fever Cases by County

COUNTY	JAN 2008	FEB 2008	MAR 2008	2007
APACHE	0	1	2	5
COCHISE	2	1	1	32
COCONINO	0	0	0	13
GILA	1	0	2	15
GRAHAM	3	0	0	24
GREENLEE	0	0	1	2
LA PAZ	1	0	0	15
MARICOPA	314	309	243	3471
MOHAVE	1	7	4	50
NAVAJO	2	3	2	11
PIMA	98	67	46	918
PINAL	22	26	17	256
SANTA CRUZ	1	1	0	7
YAVAPAI	1	0	3	26
YUMA	0	2	0	13
TOTAL	446	417	321	4858

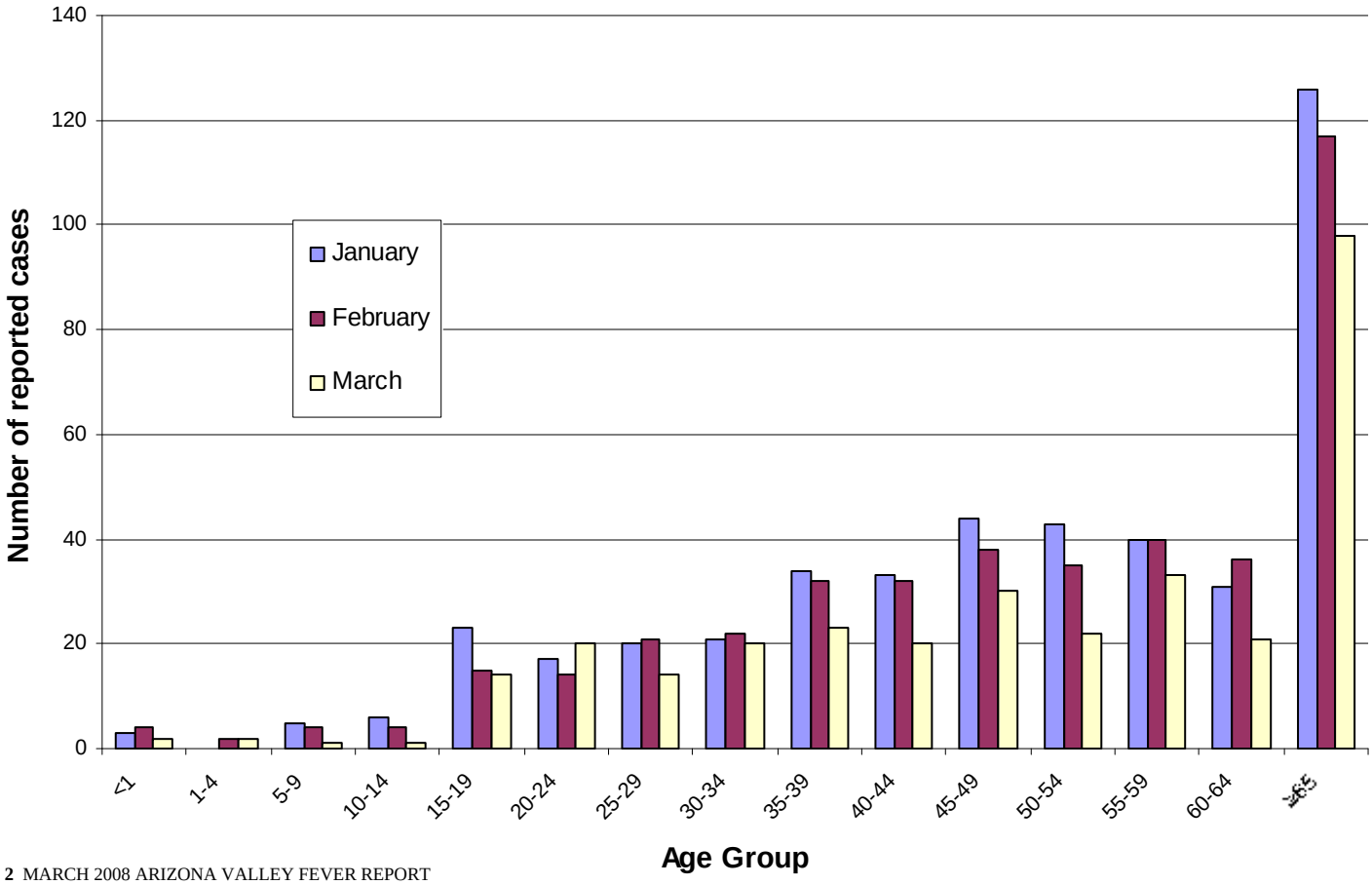
From January 2008 to March 2008, fourteen counties reported cases of valley fever. Valley fever cases continue to occur predominantly in the most populated counties of Maricopa, Pinal, and Pima.

Demographics of Valley Fever Cases:

Graph 1. Reported Valley Fever Cases by Age Group, 2007



Graph 2. Valley Fever Cases by Age Group, January-March 2008



When comparing the number of cases and rates of valley fever by age group (see Graph 1 and 2), we see that the majority of cases continue to occur in people who are 65 years old or older. The average age of valley fever cases for 2007 was 51 (median = 52). We estimate that every year about 50,000 people in the United States (30,000 Arizonans) become ill with valley fever. Most of these cases experience mild flu-like symptoms and are less likely to visit healthcare providers, get tested, and be reported to the health department than people who are more severely ill.

Table 2. Race and Ethnicity of Valley Fever Cases compared to Arizona Demographics

Race	Jan 2008 (n=176)	Feb 2008 (n=130)	Mar 2008 (n=96)	2007 (n=1882)	2007 Demo* (n=6,432,007)
American Indian/ Alaska Native	9 (5.1%)	5 (3.9%)	6 (6.3%)	92 (4.9%)	337,764 (5.3%)
Asian/Hawaiian/ Pacific Island	3 (1.7%)	2 (1.5%)	0 (0.0%)	51 (2.7%)	169,780 (2.6%)
Black/African-American	9 (5.1%)	13 (10.0%)	6 (6.3%)	136 (7.2%)	253,477 (3.9%)
White	136 (77.3%)	95 (73.1%)	71 (74.0%)	1442 (76.6%)	3,872,764 (60.2%)**
Other	19 (10.8%)	15 (11.5%)	13 (13.5%)	161 (8.6%)	—

Ethnicity	Jan 2008 (n=406)	Feb 2008 (n=371)	Mar 2008 (n=255)	2007 (n=4350)	2007 Demo (n=6,432,007)
Hispanic	19 (4.7%)	21 (5.7%)	16 (6.3%)	272 (6.3%)	1,798,222 (28.0%)
Not Hispanic	80 (19.7%)	57 (15.4%)	42 (16.5%)	874 (20.1%)	4,633,785 (72.0%)
Unknown	307 (75.6%)	293 (79.0%)	197 (77.3%)	3204 (73.7%)	—

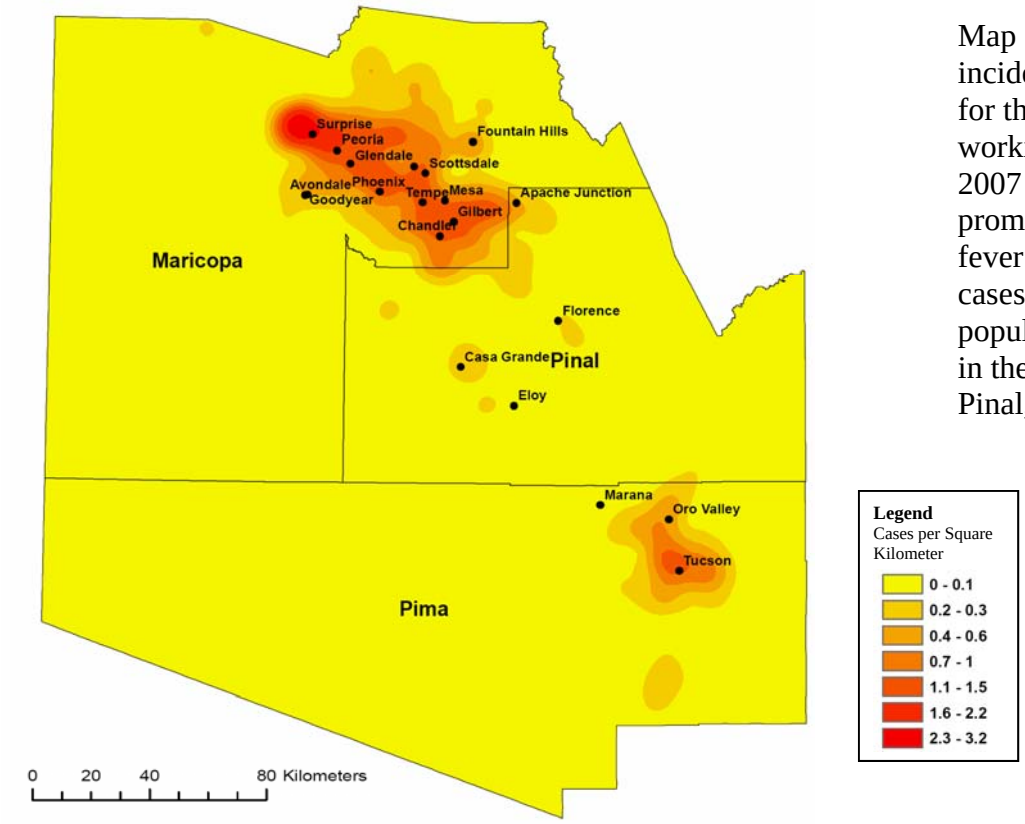
For the year 2007, only 39% (1882/4858) of the valley fever cases reported to the state health department contain information about race. African-Americans are more likely to be reported with valley fever as compared to the general population (Table 2).

*Arizona Vital Statistics uses five categories for race/ethnicity: American Indian or Alaska Native, Asian or Pacific Islander, Black or African-American, White non-Hispanic and Hispanic or Latino ethnicity. Demo = demographics

**For 2007 demographics for the state of Arizona, white means white non-Hispanic.

Areas with Valley Fever Activity:

Map 3.
Density Map of Valley Fever Incidence in Maricopa, Pinal & Pima Counties, 2006



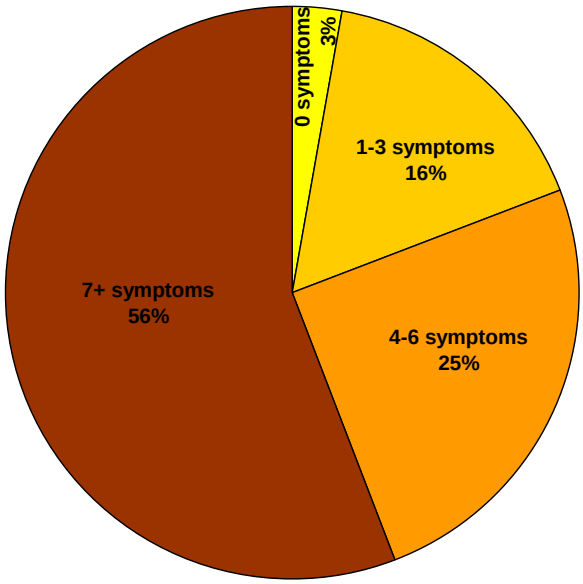
Map 3 measures valley fever incidence per square kilometer for the year 2006. We are working on a density map for 2007 in our efforts to identify prominent areas of valley fever incidence. Valley fever cases occur primarily in populated areas, most notably in the counties of Maricopa, Pinal, and Pima.

Enhanced Surveillance of Valley Fever:

The Arizona Department of Health Services is carrying out enhanced surveillance measures to investigate valley fever. Our aim is to interview every 10th valley fever case that is reported. So far we have interviewed 451 cases. This report highlights some of the major findings of this project.

Symptoms and Pre-existing Conditions:

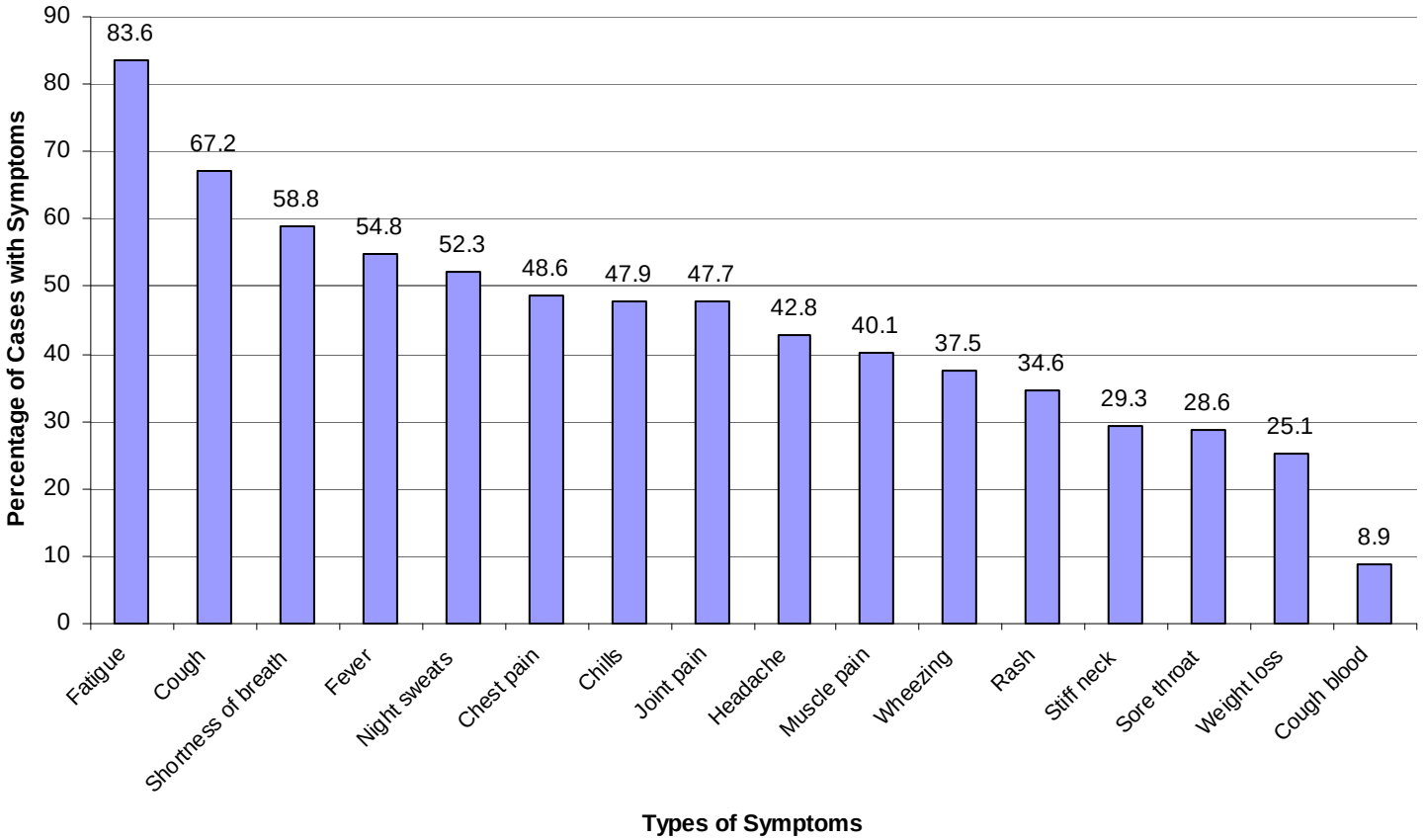
Graph 3. Distribution of Symptoms in Valley Fever Cases*



As shown in Graph 3, 56% of cases interviewed had seven or more symptoms for valley fever. The percentages of cases who reported experiencing some of the most common symptoms of valley fever are shown below in Graph 4. 84% had fatigue and 67% had a cough. Previous data show that 60% of people who are infected with *Coccidioides* species have mild or no symptoms. Thus, people who have symptoms are more likely to visit providers, get tested for valley fever and be reported to the health department. For this reason, our data is more likely to include the most severe cases of coccidioidomycosis.

*The graphs only include the common symptoms of fever, cough, sore throat, wheezing, chills, dyspnea (shortness of breath), night sweats, chest pain, fatigue, hemoptysis (coughing up blood), headache, rash, stiff neck, myalgias (muscle pain), arthralgia (joint pain), and weight loss.

Graph 4. Common Symptoms of Valley Fever Cases*



Diagnosis and Healthcare Visits:

We evaluated where valley fever cases were seen for their illness and how often they sought medical care. As shown in Table 5, 43% of patients reported going to the emergency room at least once over the course of their illness, and 40% said that they were hospitalized overnight for their illness. People with valley fever waited an average of 47 days before seeking care for their symptoms. It took an average of 3 visits to a healthcare provider before a patient was tested for valley fever. 17% of patients asked their providers to test them for valley fever. 28% of patients saw their doctors more than ten times for their valley fever illness (Graph 5). Prior to the most recent diagnoses of valley fever, 10% of patients interviewed had been told that they had valley fever before. 46% of patients were told that they had pneumonia and 58% were treated with antibiotics. 59% of patients were treated with antifungals.

Table 3.
Location where Cases First Sought Treatment for Valley Fever

Location	Count (n=451)
Emergency room	103 (22.8%)
Primary care physician	251 (55.7%)
Urgent Care	52 (11.5%)
Other	24 (5.3%)
Unknown	21 (4.7%)

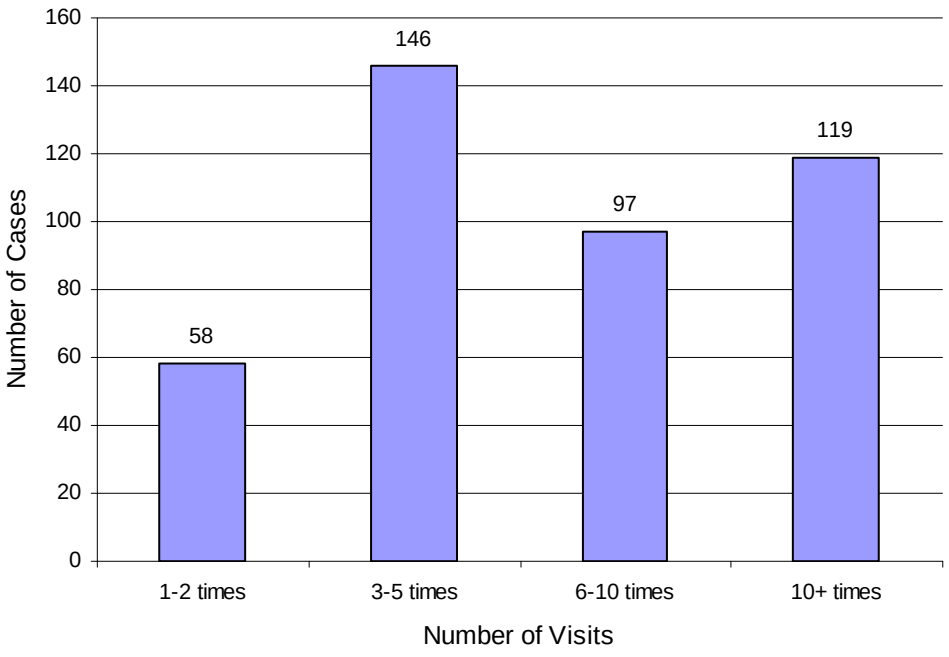
Table 4.
Length of Antibiotic Treatment

Length of treatment	Count (n=278)
Less than 1 week	64 (23.0%)
1-2 weeks	108 (38.8%)
3-4 weeks	38 (13.7%)
1-2 months	18 (6.5%)
Greater than 2 months	17 (6.1%)
Unknown	33 (11.9%)

Table 5.
Specifics of Healthcare Visits

Healthcare Visit (n=451)	Yes	No	Unknown
Visited the emergency room for illness	195 (43.2%)	236 (52.3%)	20 (4.4%)
Hospitalized overnight for illness	182 (40.4%)	258 (57.2%)	11 (2.4%)
Chest x-ray performed by provider	402 (89.1%)	33 (7.3%)	16 (3.5%)
Provider informed patient of pneumonia	208 (46.1%)	218 (48.3%)	25 (5.5%)
Patient knew of diagnosis before contacted by ADHS	359 (79.6%)	60 (13.3%)	32 (7.1%)
Patient asked provider to test for valley fever	77 (17.1%)	358 (79.4%)	16 (3.5%)
Provider prescribed antibiotic for illness	263 (58.3%)	131 (29.0%)	57 (12.6%)
Provider prescribed antifungal for illness	266 (59.0%)	163 (36.1%)	22 (4.9%)

Graph 5.
Number of Times Valley Fever Cases Visited a Healthcare Provider over the Course of Illness



Impact of Valley Fever and Exposures:

Individuals reported that the average length of their symptoms was 197 days (median = 120) (Table 6). However, 56% of the patients had not yet recovered from their symptoms of valley fever at the time of the interview. Of those that have not yet recovered, the average length of symptom duration was 313 days (median = 162). 51% of the cases interviewed did not have a paid job or business and 12% were attending school when their illnesses began. Of those who had jobs, 74% missed work due to their illnesses, and 60% of those who were attending school missed school due to their illnesses. 75% of the people interviewed said that their illnesses prevented them from doing their usual daily activities. On average, the amount of time missed from performing daily activities was three months (90 days). 51% said they were exposed to dust through their work or daily activities. Most of the cases (73%) said that they spent at least 2 hours a week outdoors (Table 7). 55% of people diagnosed with valley fever said that they lived within one mile of construction.

Table 6.
Symptom Duration and Number of Days Lost for Valley Fever Cases

Impact of Valley Fever	n	Mean	Median
Symptom duration (days) for those who recovered*	153	65.3	42
Symptom duration (days) for those not yet recovered	234	277.6	159.5
Symptom duration (days) for both recovered and not yet recovered	387	193.7	120
Number of days missed from work	149	31.8	14
Number of days missed from school	32	15.1	8
Number of days missed from daily activities	344	89.6	45

*An error in the previous report showed that n = 178 for symptom duration for those who recovered. This mistakenly included symptom duration for some individuals who had not yet recovered.

Table 7.
Length of Time Spent Outdoors for Valley Fever Cases

Length of Time/Week	Count (n=451)
<2 hrs	48 (10.6)
2-20 hrs	223 (49.4%)
20-40 hrs	74 (16.4%)
>40 hrs	33 (7.3%)
Unknown	73 (16.2%)

Table 8.
Dust Exposures for Valley Fever Cases

Exposed	Count (n=264)
Constantly	45 (17.0%)
Intermittently/Sometimes	167 (63.3%)
Rarely	52 (19.7%)

Table 9.
Years Lived in Arizona & Average Age of Cases Interviewed

Demographics	n	Mean	Median
Number of years lived in Arizona	415	16.7	13
Age of cases interviewed	451	52.4	54

Demographics and Valley Fever Awareness:

53% of patients interviewed were male. 57% had a history of smoking. 17% had malignant disease, cancer or transplant as un underlying medical condition present at time of diagnosis. Although the average number of years lived in Arizona at the time of diagnosis was 17 years (Table 9), 57% lived in Arizona for less than 15 years (Graph 6). Our data support the hypothesis that those who are newer to the Arizona area are more susceptible to acquiring valley fever. However, many of our cases lived 10 years or longer in Arizona (Graph 6) indicating that other factors may be important in becoming infected with the *Coccidioides* fungus. Table 9 shows that the average age of the cases interviewed was 52 years old, which is comparable to the average age of reported cases in 2007 (51 years old).

Graph 6.
Length of Time that Valley Fever Cases Lived in Arizona Prior to Diagnosis

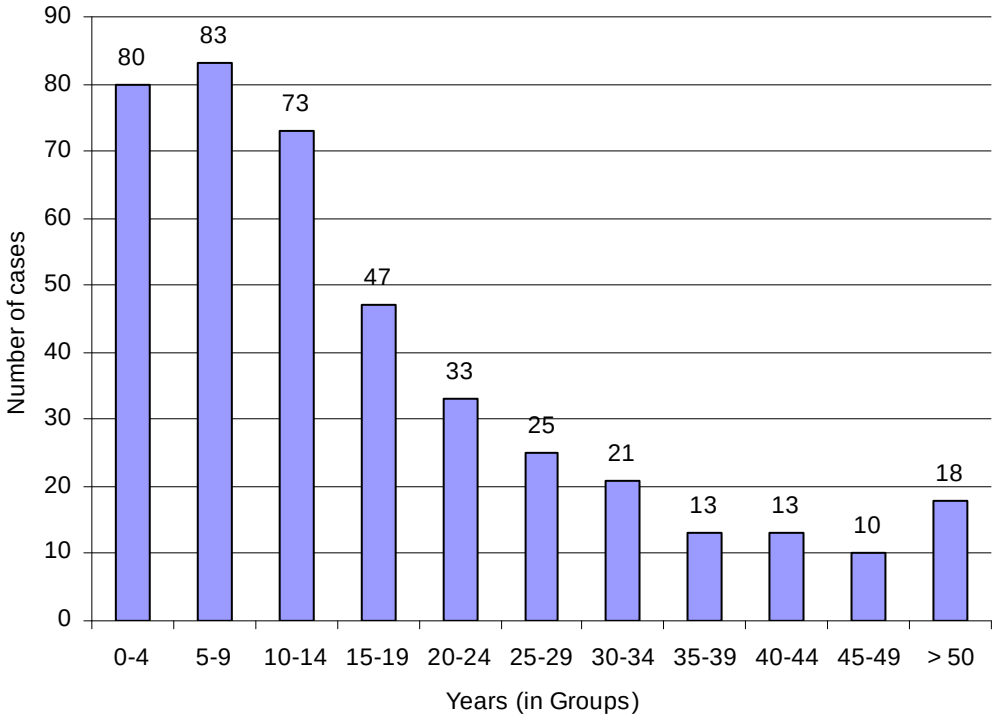


Table 10.
Race and Ethnicity of Valley Fever Cases compared to State Demographics

Race	Cases Interviewed (n=451)	2007 (n=1882)	2007 Demo* (n=6,432,007)
American Indian/Alaska Native	10 (2.2%)	92 (4.9%)	337,764 (5.3%)
Asian/Hawaiian/ Pacific Island	20 (4.4%)	51 (2.7%)	169,780 (2.6%)
Black/African-American	36 (8.0%)	136 (7.2%)	253,477 (3.9%)
White	354 (78.5%)	1442 (76.6%)	3,872,764 (60.2%)**
Other	26 (5.8%)	161 (8.6%)	—
Unknown	5 (1.1%)	—	—

Ethnicity	Cases Interviewed (n=451)	2007 (n=4350)	2007 Demo (n=6,432,007)
Hispanic	52 (11.5%)	272 (6.3%)	1,798,222 (28.0%)
Not Hispanic	388 (86.0%)	874 (20.1%)	4,633,785 (72.0%)
Unknown	11 (2.4%)	3204 (73.7%)	—

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**For 2007 state demographics, white means white non-Hispanic.

In Table 10, we see that only 2% of cases interviewed during our enhanced surveillance were American Indians compared to the 5% incidence of American Indian valley fever cases. This may suggest the need to communicate with Indian Health Services and other related agencies to identify and interview more American Indians. 90% of the people interviewed had health insurance when they were seeking medical treatment for their illnesses whereas 82% of the Arizonan population is insured (U.S. 2000 Census Data). 65% of the cases said they knew about valley fever before they were diagnosed. Of the people who had previous knowledge about valley fever, only 6% learned about valley fever from their healthcare providers. At the time of the interview, 19% of cases did not know how the disease is contracted.

Further analysis will be done as we complete more interviews and receive more reports.